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A. PERSONAL

Born: Haifa, Israel, 1955.
Domestic Status: Married + 3

B. EDUCATION

1979 - 1982 - B.Sc. in Physics and Mathematics - Tel Aviv University, *magna cum laude*
1982 - 1984 - M.Sc. in Physics - Tel Aviv University, *magna cum laude*
1984 - 1988 - Ph.D. in Physics, Tel Aviv University, *summa cum laude*

C. PROFESSIONAL EXPERIENCE

1988-1991 - IBM, T. J. Watson Research Center, NY, USA
1991-1995 - Senior Lecturer, Physics Dep. Technion-IIT, Israel
1995-1999 - Associate Prof., Physics Dep. Technion-IIT, Israel
1999-present - Professor, Physics dep., Technion - IIT, Israel.

D. INVITED TALKS IN INTERNATIONAL CONFERENCES-RECENT 5 YEARS

1995 Franco-Israeli meeting, Paris - France, *Microscopic Fluctuations in the Ground State Energy of a Disordered Quantum dot.*
1995 Aronov Memorial Symposium, Zichron Ya'akov - Israel, *Spectroscopy of Disordered Quantum Dots.*
1996 Conference on Quantum Chaos in Mesoscopic Systems, Santa Barbara - USA, *The chemical Potential of A Strongly Interacting 2D Fermion Layer.*

- 1996 Spring College in Condensed Matter Physics, International Center for Theoretical Physics, Trieste -Italy, three lectures course on *Experiments in Mesoscopic Systems*.
- 1996 Adriatico Research Conference on Mesoscopic Phenomena in Complex Quantum Systems, Trieste - Italy, *Excitation Spectrum and Ground State Level Statistics of Disordered Quantum Dots*.
- 1996 International Conference on "Correlated Electrons in Systems of Reduced Dimensionality", Trieste-Italy, *The Thermodynamics of Strongly Correlated Fermions*.
- 1996 International Conference on Electron Localization and Quantum Transport in Solids, Jaszowiec - Poland, *Experiments on Level Statistics in Diffusive Quantum Dots*.
- 1996 International Conference on Electron Localization and Quantum Transport in Solids, Jaszowiec - Poland, *The Compressibility of Fermions at Large F_0 Numbers*.
- 1997 Minerva Conference on Mesoscopic Physics, Eilat - Israel, *The Coulomb Blockade Revisited*.
- 1997 Japan-Israel binational conference on mesoscopic physics, Beer Sheva - Israel, *The Role of Coulomb Correlations in Quantum Dots*.
- 1997 The annual meeting of the Israeli Physical Society, Beer Sheva - Israel, *Correlation Energy of Strongly Interacting Fermions at High F_0 Numbers*.
- 1997 International workshop on "Direction in Mesoscopic Physics", Leiden-Holland, *The Coulomb Blockade, Revisited*.
- 1997 International Conference on Mesoscopic Physics, MESO97, Chernogolovka - Russia, *Correlation Energy of Strongly Interacting Fermions at High F_0 Numbers*.
- 1997 International conference on "Fundamental Aspects of Applications of Single Electron Devices", Lyngby - Denmark, *Ground State Properties of a Quantum Dots*.
- 1997 International Conference on Strongly Coupled Coulomb Systems, Chestnut Hill - USA, *2D Fermions - Experiment* (presented by Dr. S. Shapiro).
- 1998 International Summer School on Coherence in Electronic Systems, Ustron, Poland, *Coherence and Dephasing in Low Dimensional Systems*.
- 1998 European Conference on Mesoscopic Physics, PHASDOM-98, Neuchatel, Switzerland, *Self Assembly of Nanoscale Electronics by Biotechnology*.

- 1998 Nordic-Baltic Physical Society meeting, Nyborg, Denmark, *Self Assembly of Nanoscale Electronics by Biotechnology.*
- 1998 International Conference on the Physics of Semiconductors (ICPS Jerusalem, Israel, *Coulomb Drag in the Quantum Hall Effect Regime.*
- 1998 International Workshop on "Disorder and Interactions in Quantum Hall and Mesoscopic Systems", Santa Barbara, USA, *Coulomb Correlations in a Dilute 2D Fermion System.*
- 1998 International Workshop on "Electron Transmission through Molecules and Interfaces", Zanzich, Israel, *Self assembly of Nanometer Scale Electronics using Biotechnology.*
- 1999 The annual meeting of on the American Material Research Society (MRS), San Francisco USA, *Self Assembly of Nanometer Scale Electronics by Biotechnology.*
- 1999 The International Conference on the Physics of Two Dimensional Electronic Systems-EP2DS 22, Ottawa Canada, *Self Assembly of Nanometer Scale Electronics by Biotechnology.*
- 1999 International workshop on "New Developments in Quantum Hall Effect", Minneapolis USA, *Electron-Hole Drag in the QHE Regime.*
- 1999 The German Physical Society Meeting, Munster, Germany, *Self Assembly of Molecular Scale Electronics by Biotechnology.*
- 1999 Nato Advanced Research Workshop, Kiev, Ukraine, *Some Aspects of Molecular Self Assembly.*
- 1999 Rencontres de Moriond, Les Arcs France, *Metal-Insulator Transition in 2D?*
- 1999 The First Stig Landqvist Research Conference on the Advancing Frontiers in Condensed Matter Physics - Quantum Phases in Electron Systems of Low Dimensions, Trieste Italy, *The Compressibility of Strongly Correlated 2D Fermions Near the Metal Insulator Transition.*
- 1999 The "Microelectronics Advanced Research Initiative" workshop on Nanofabrication", Marseille France, *Self Assembly of Molecular Electronics by Biotechnology.*
- 1999 IST99 Conference on "wet frontiers in microelectronics - the interface between biology and microelectronics", Helsinki Finland, *Conceptual and Practical Challenges in the Self Assembly of Microelectronics Using Biotechnology.*
- 2000 Nato Advanced Research Workshop on "Frontiers in Nano-Optoelectronics Systems", Kyiv Ukraine, *Self Assembly of Molecular Scale Electronics by Biotechnology.*

- 2000 Winter School on the physics of low dimensional systems, Mamendorf Austria, *Molecular Electronics by Biotechnology.*
- 2000 International workshop on "Chaos and Interaction in Quantum Dots", Minnesota, USA, *Condensation of Positively Charged Colloids on DNA.*
- 2000 MesoSpin 2000, Curuma, Italy, *Condensation of Positively Charged Colloids on DNA.*
- 2000 Japan-Israel binational meeting, Tokyo Japan, *Condensation of Positively Charged Colloids by DNA.*
- 2001 10th Brazilian Workshop on Semiconductor Physics, Guarujá SP Brazil, *Self Assembly of Molecular Scale Electronics by Biotechnology.*
- 2001 Rencontre de Moniond meeting, Les Arcs France, *Evidence Against Metal-Insulator Transition in Two Dimensional Holes.*
- 2001 American Physical Society meeting, Seattle Washington USA, *Evidence Against Metal-Insulator Transition in Two Dimensional Holes.*
- 2001 NATO summer school, Windsor England, *Self Assembly of Molecular Scale Electronics by Biotechnology.*
- 2001 Workshop on Nanoscience, Dresden, Germany, *Summary and Perspectives of Nanotechnology.*

B. LIST OF PUBLICATIONS

1. J. Salzman, U. Sivan, E. Kapon, and A. Katzir, "Heterodyne Detection Using Multimode Waveguide Y-Couplers", *Appl. Opt.* **22**, 31 (1983).
2. A. Yariv, C. Lindsey, and U. Sivan, "Approximate Analytic Solution for Electronic Wavefunctions and Energies in Coupled Quantum Wells", *J. Appl. Phys.* **58**, 3669-3672 (1985).
3. U. Sivan and Y. Imry, "Multichannel Landauer Formula for Thermoelectric Transport with Application to the Thermopower Near the Mobility Edge", *Phys. Rev. B* **33**, 551-558, (1986).
4. U. Sivan and Y. Imry, "Energy Level Correlation Function and ac Conductivity of a Finite Disordered System", *Phys. Rev. B* **35**, 6074-6083 (1987).
5. U. Sivan and A. Se'ar, "Lightwaves Localization in Dielectric Waveguides", *Europhys. Lett.* **5**, 139-144 (1988).
6. U. Sivan, O. Entin-Wohlman, and Y. Imry, "Orbital Magnetoconductance in the Variable Range Hopping Regime", *Phys. Rev. Lett.* **60**, 1566-1569 (1988).
7. U. Sivan, R. Blumenfeld, Y. Meir, and O. Entin-Wohlman, "Dynamic Structure Factor of a Deterministic Fractal", *Europhys. Lett.* **7**, 249-253 (1988).

8. U. Sivan and Y. Imry, "de Haas-van Alphen and Aharonov-Bohm-type Persistent Current Oscillations in Singly Connected Quantum Dots", *Phys. Rev. Lett.* **61**, 1001-1004 (1988).
9. U. Sivan, Y. Imry, and C. Hartzstein, "Aharonov-Bohm and Quantum Hall Effects in Singly Connected Quantum Dots", *Phys. Rev. B* **39**, 1242-1250 (1989).
10. O. Entin-Wohlman, Y. Imry, and U. Sivan, "Orbital Magnetoconductance in the Variable Range Hopping Regime", *Phys. Rev. B* **40**, 8342-8348 (1989).
11. O. Entin - Wohlman, U. Sivan, R. Blumenfeld, and Y. Meir, "Dynamic Structure Factor of a Fractal", *Physica D* **38**, 93-97 (1989).
12. U. Sivan, M. Heiblum, and C. P. Umbach, "Hot Ballistic Transport and Phonon Emission in a Two-Dimensional Electron Gas", *Phys. Rev. Lett.* **63**, 992-995 (1989).
13. C. P. Umbach, A. Palevski, M. Heiblum, and U. Sivan, "Lateral Tunneling and Ballistic Transport in Two-Dimensional Electron Gas Devices Defined by Nanostructure Gates", *J. Vac. Sci. Technol. B* **7**, 2003 (1989).
14. U. Sivan, M. Heiblum, C. P. Umbach, and H. Shtrikman, "Electrostatic Electron Lens in the Ballistic Regime", *Phys. Rev. B* **41**, 7937-7940 (1990).
15. I. Kander, Y. Imry, and U. Sivan, "Effects of Channel Opening and Disorder on the Conductance of Two Dimensional Wires", *Phys. Rev. B* **41**, 12941-12944 (1990).
16. B. Laikhtman, U. Sivan, A. Yeacoby, C. P. Umbach, M. Heiblum, J. A. Kash, and H. Shtrikman, "Long Mean Free Path of Hot Electrons Injected to Higher Subbands", *Phys. Rev. Lett.* **63**, 2181-2184 (1990).
17. D. Kowal, U. Sivan, O. Entin-Wohlman, and Y. Imry, "Transmission in Multiply Connected Wire Systems", *Phys. Rev. B* **42**, 9009-9018 (1990).
18. U. Sivan, A. Palevski, M. Heiblum, and C. P. Umbach, invited paper on "Ballistic Transport in a Two-Dimensional Electron Gas", *Solid State Electronics*, **33**, 979-986 (1990).
19. M. Heiblum, A. Palevski, U. Sivan, and C. P. Umbach, "Hot Electron Transport in the Plane", *Surf. Sci.* **229**, 155 (1990).
20. U. Sivan, O. Entin-Wohlman, and Y. Imry, "Orbital Magnetoconductance in the Variable Range Hopping Regime - Percolation Approach" pp. 151-167, in "Hopping and Related Phenomena", edited by Hellmut Fritzze and Michael Pollak, 1990 World Scientific publishing company.
20. A. Palevski, U. Sivan, M. Heiblum, C. P. Umbach, and H. Shtrikman, "Hot Electron Transport in Two - Dimensional Structures", *Acta Physica Polonica A* **79**, no.1, 59-69 (1991).

21. A. Yacoby, U. Sivan, C. P. Umbach, and J. M. Hong, "Interference and Dephasing by Electron - Electron Interaction on Length Scales Shorter Than The Elastic Mean Free Path", *Phys. Rev. Lett.* **66**, 1938-1941 (1991).
22. U. Sivan, A. Yacoby, C. P. Umbach, and J. M. Hong, "Coherence and Electron - Electron Interaction in Ballistic Conductors", in "Nanostructures and Mesoscopic Systems", pp. 119-130, Academic Press Inc. (1992).
23. M. Heiblum and U. Sivan "Hot Electron Transport in a High Mobility Two Dimensional Electron Gas", in "Hot Carriers in Semiconductors Physics and Applications", edited by J. Shah, Academic Press Inc. (1992).
24. U. Sivan, P. M. Solomon, and H. Shtrikman, "Coupled Electron - Hole Transport", *Phys. Rev. Lett.* **68**, 1196-1199 (1992).
25. U. Sivan, K. Milkove, F. P. Milliken, S. Rishom, D. Kern, "Spectroscopy, Electron-Electron Interaction, and Energy Level Statistics in a Disordered Quantum Dot", *Physica Scripta*, **49B**, 446-448 (1993).
26. S. A. Rishom, Y. H. Lee, K. R. Milkove, J. M. Hong, V. Boegli, M. DeFranza, U. Sivan, and D. P. Kern, "Integrated Approach to Quantum Dot Fabrication", *J. Vac. Sci. Technol. B*, **11**, 2607-2611 (1993).
27. U. Sivan, K. Milkove, F. P. Milliken, S. Rishom, D. Kern, "Spectroscopy, Electron-Electron Interaction, and Energy Level Statistics in a Disordered Quantum Dot", *Europhysics Lett.* **25**, 605-611 (1994).
28. U. Sivan, Y. Imry, and A. G. Aronov, "Quasi Particle Lifetime in a Quantum Dot", *Europhys. Lett.* **28**, 115-120 (1994).
29. Y. Imry and U. Sivan, Invited review paper on "Recent Developments in Mesoscopic Physics", special issue on *Highlight in Condensed Matter Physics*, *Solid State Comm.*, **92**, 83-87 (1994).
30. S. Shapira, U. Sivan, P. M. Solomon, E. Buchstab, and M. Tischer, "The Thermodynamics of a Charged Fermion Layer at High r_s Values", *Phys. Rev. Lett.* **77**, 3181-3184 (1996).
31. U. Sivan, R. Berkovits, Y. Aloni, O. Prus, A. Auerbach, and G. Ben-Yoseph, "Mesoscopic Fluctuations in the Ground State Energy of Disordered Quantum Dots", *Phys. Rev. Lett.* **77**, 1123-1126 (1996).
32. O. Prus, A. Auerbach, U. Sivan, Y. Aloni, and R. Berkovits, "Even-Odd Correlations in Capacitance Fluctuations of Quantum Dots", *Phys. Rev. B* **54**, R14289-92 (1996).
33. Y. Imry, A. Stern, and U. Sivan, "Electron-electron Scattering and Transport in Granular Systems", *Europhys. Lett.* **39**, 639-643 (1997).
34. R. Berkovits and U. Sivan, "Transmission Through an Interacting Quantum Dot", *Europhys. Lett.* **41** 653-658 (1998).

35. E. Braun, Y. Eichen, U. Sivan and G. Ben Yoseph, "DNA templated assembly and electrode attachment of conducting silver wire", *Nature*, 391, 775-778 (1998).
36. Y. Eichen, E. Braun, U. Sivan, and G. Ben Yoseph, "Self Assembly of Nanoelectronics Components and Circuits Using Biological Templates", *Acta Polymerica* 49, 663-670 (1998).
37. Y. Yaish, Oleg Prus, Evgeny Buchstab, Shye Shapira, Gidi Ben Yoseph, Uri Sivan, and Ady Stern, "Interband Scattering and the "Metallic Phase" of Two Dimensional Holes in GaAs/AlGaAs", *Phys. Rev. Lett.* 84, 4934-4937 (2000).
38. K. Keren, A. Stern, and U. Sivan, "Electron-Electron Lifetime-What is the Difference Between an Atom and a Quantum Dot", *Eur. Phys. J. B* 18, 311-318 (2000).
39. O. Prus, M. Reznikov, U. Sivan, and V. Pudalov, "On the Cooling of Electrons in a Silicon Inversion Layer", *Phys. Rev. Lett.* 83(1) (2001).

Papers published in proceedings.

1. E. Kapon, U. Sivan, J. Salzman, and A. Katzir, "Heterodyne Detection Using Multimode Waveguide Y-Couplers", *SPIE Proceedings*, San Diego 1983.
2. U. Sivan, B. Laidman, A. Yacoby, C. P. Umbach, M. Heiblum, J. A. Kash, and H. Shtrikman, "Long Mean Free Path of Hot Electrons Selectively Injected to Higher Subbands", *Proceedings of the 20th International Conference on The Physics of Semiconductors*, E. M. Anastassakis and J. D. Joannopoulos editors, World Scientific (1990), pp. 375-378.
3. U. Sivan, P. M. Solomon, and H. Shtrikman, invited paper on "Coupled Electron - Hole Gases", *Proceedings of the 21st International Conference on the Physics of Semiconductors*, Beijing, China (1992).
4. P. M. Solomon, U. Sivan, and H. Shtrikman, "Transport in Coulombically coupled Electron-Hole System" (abstract), *proceedings of the 10th International Conference on the Physics of Two Dimensional Systems*, Newport, RI, USA (1993).
5. U. Sivan, invited paper on "Spectral Properties of Disordered Quantum Dots", *Proceedings of the XXIXth Rencontre des Meriond*, Villars-sur-Ollon, Switzerland (1994).
6. S. Shapira, U. Sivan, P. M. Solomon, E. Buchstab, M. Tischler, and G. Ben Yoseph, *Proceedings of 23rd International Conference on the Physics of Semiconductors*, World Scientific, Singapore, M. Schoffler and R. Zimmermann eds, P. 2311-2314 (1996).

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7. S. Shapira, U. Sivan, P. M. Solomon, E. Buchstab, and M. Tischler, "The Thermodynamics of a Charged Fermion Layer at High r_s Values", in the proceedings of the 11th International Conference on the Electronic Properties of Two-Dimensional Systems, Nottingham, UK: Surf. Sci. (Netherlands), vol.361-362, p. 113-116 (1996).

F. PATENTS

Four patent applications on applications of interfacing molecular biology with molecular electronics.